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ABSTRACT

This report presents an instructional design model that was developed for use by the End-Users Computing department of a large pharmaceutical company in developing effective--but not lengthy--microcomputer training seminars to train office workers and executives in the proper use of computers and thus increase their productivity. The 14 steps of the instructional design model are described: (1) needs, goals, and priorities analysis; (2) resource analysis; (3) individualized delivery system design; (4) module scope, objectives, and sequence; (5) target objectives definition and analysis; (6) performance objectives definition; (7) lesson module preparation; (8) materials and media selection; (9) student performance assessment; (10) instructor preparation; (11) formative evaluation; (12) field testing and revision; (13) summative evaluation; and (14) installation and diffusion. Appendices include an instructional design model flowchart; sample lesson modules; instructor, observer, and student evaluation forms; and a course module design checklist. (11 references) (MES)

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PRACTICUM REPORT

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AN INSTRUCTIONAL DESIGN MODEL FOR DEVELOPING A COMPUTER CURRICULUM TO INCREASE EMPLOYEE PRODUCTIVITY IN A PHARMACEUTICAL COMPANY

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NOVA UNIVERSITY

An Instructional Design Model For Developing a Computer Curriculum to Increase Employee Productivity in a Pharmaceutical Company

by

Mark R. Stumpf

Cohort IV

A Practicum II Report Presented to the Ed.D. Program in Partial Fulfillment of the Requirements for the Degree of Doctor of Education in Computer Education

NOVA UNIVERSITY

1987

ABSTRACT

An Instructional Design Model for Developing a Computer Curriculum to Increase Employee Productivity in a Pharmaceutical Company.

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Descriptors: Business/Training/Microcomputers/Industry/Cost Effectiveness/Productivity Improvement/Instructional Design Model/Computer Curriculum.

This practicum project developed an Instructional Design Model for computer training in the diagnostics division of a large pharmaceutical company. The company had invested heavily in personal computers in an effort to capitalize on the increased productivity possible through their use. The company also had plans to purchase about 200 new PCs per year for the next several years and to place most of these PCs on the desks of workers, managers, and executives who have limited computer knowledge. The practicum began shortly after the company formed a new department to train employees in the proper use of computer. The goal was an increase in employee productivity.

Literature supports the company's action to purchase PC workstations for the purpose of increasing worker productivity. Literature also confirms that proper training can pay huge dividends, while the lack of training can actually be detrimental to worker productivity.

An Instructional Design Model was prepared which recommended a preparation format for computer course modules. The recommendations also included a flowchart which graphically depicts the recommended curriculum design process, checklists to evaluate a course proposal, sample pilot lesson plans, and formative evaluation questionnaires. The project concluded with checklists that the training department manager could use to evaluate a course proposal submitted by trainers on his staff.

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Chapter I

INTRODUCTION

This practicum was implemented in a diagnostics company that employs 2036 people. The company is a division of a high-tech pharmaceutical Fortune 100 corporation that distributes products in 72 countries worldwide.

In the last three years the company invested heavily in personal computers in an effort to increase productivity through their use. In July 1987, the company formed the End-Users Computing department (EUC). The EUC department planned to provide computer support to PC end-users through training seminars. The stated goal of the EUC training department was to increase the employee productivity by developing effective courses that are not lengthy, but are effective teaching aids.

The manager of the EUC department recognized that while the training objectives were clear, they lacked a formalized Instructional Design Model. Therefore, he retained this writer as a consultant to develop an Instructional Design Model for his department's use in the development of new computer training modules.

Chapter II

STUDY OF THE PROBLEM

Recognizing that computers can increase worker productivity by simplifying the administrative process, the company has invested heavily in personal computers for their employees in the last three years. When properly used, computers can help workers access and/or develop information more quickly than the conventional paper-and-pencil process. The company projects that within a few years most office workers and executives in the company will have a computer on their desk to aid them in making better business decisions.

The company expects to purchase about 200 new PCs per year for the next several years. The majority of these PCs will be placed on the desks of office workers, managers, and executives who have limited, or no, computer knowledge. In order to achieve the substantial productivity gains possible through computer use, the employees will need effective training.

Current literature supports the company's action to purchase PC workstations for their employees and also shows the need for effective employee training. A study by Baker (1981) shows that "installing executive terminals will cut office expenses." He estimates that 15 to 20 percent of a manager's time could be saved through the implementation of

a computerized workstation. In hard dollar savings, Baker estimates that a potential time savings valued at over $65 billion annually could be realized nationwide. Roman (1985) states that "anyone hoping to use a computer well, from the clerical on up to senior executives" will require structured training. He continues, "a training program can give you the confidence of knowing workers aren't wasting time scanning their keyboards searching for every other key."

According to Littlehailes (1983), large savings can occur when productivity training is offered to managers or professionals who currently have terminals or personal computers. He states that the average person "needs only 10 hours of training to attain a 20 percent improvement in productivity."

Currently, the EUC department does not offer courses for the new computer users and has determined that it is not practical or cost effective to send a sizable number of employees to the local Junior College. Therefore, the EUC department plans to start developing a computer curriculum in 1988 for training employees. At the start of this practicum the EUC department manager was in the process of preparing a needs analysis and cost estimates which had to be completed by October 18, 1987 in order to be approved by the company for implementation in 1988. However, the EUC department manager recognized that a formal Instructional Design Model is required in order for the expanded

curriculum offering to be successful.

Gagne and Briggs (1978) support the need for a formalized instructional system.

> "The purpose of an instructional system ...is to provide the necessary means for achieving all the types of outcomes called for in the curriculum or course being considered. The design of such an instructional system is drawn from the accumulated wisdom contained in teaching models, learning theory, and other relevant disciplines and experiences."

Davies and Hartley (1972) emphasize that instructional system designing "utilizes a kind of knowledge called educational technology." This educational technology has developed into the systems approach and has been in industrial and military training, as well as in school systems.

Chapter III

OUTCOME AND EVALUATION INSTRUMENTS

This practicum serves as an Instructional Design Model report intended to aid the EUC department in developing a computer curriculum. It also will be used in the preparation of course modules for employee training on the personal computer. This report includes the following elements:

- A recommended Instructional Design Model for the EUC computer curriculum.
- An Instructional Design Model Flowchart that graphically depicts the recommended curriculum design process.
- A sample pilot course module lesson plan to illustrate the principles of the Instructional Design Model at the lesson level.
- A checklist for the EUC manager to evaluate a course proposal submitted by the trainers on his staff.
- Formative evaluation questionnaires for the instructor, student, and observer.

Chapter IV

SOLUTION STRATEGY

Members of the EUC training department were interviewed to determine their training goals. These goals were then analyzed and then structured into two categories, the current training needs and the future training needs. An extensive study of Instructional Design references resulted in the choice of the Gagne and Briggs Instructional Design Model, as outlined in their book PRINCIPALS OF INSTRUCTIONAL DESIGN. The main advantage of the Gagne and Briggs model was a systems level approach which emphasizes present and future instructional needs. This approach best meets the needs of the EUC department.

The actions taken to implement the practicum included:

	TASK	COMPLETION DATE
o	Interviewing all the members of the EUC training department to determine their training goals.	08/15/87
o	Analyzing the training goals of the EUC training department and structuring them in accordance with the Gagne and Briggs model.	08/20/87
o	Devising an Instructional Design Flowchart to graphically depict the recommended curriculum design process.	08/25/87
o	Preparing a recommended Instructional Design Model to be used in the EUC curriculum design.	09/01/87

- Developing a checklist that the manager of EUC could use to evaluate a course proposal submitted by the trainers on his staff. 09/10/87
- Developing a sample pilot lesson plan to illustrate the application of the Instructional Design Model at the lesson level. 09/15/87
- Preparing formative evaluation questionnaires for the instructor, student, and observer. 09/18/87
- Completing the draft report and submitting it to the manager of EUC for review and comments. 10/01/87
- Submitting the final practicum report. 10/10/87

This writer was the primary planner and writer of the Instructional Design Model and frequent drafts were submitted to the manager of End-Users Computing for review. Upon completion of the final practicum report, this writer's responsibility ended.

Chapter V

RESULTS

This Instructional Design Model (IDM) was prepared as a guide for developing employee computer training curriculum modules within the company. The IDM was developed after reviewing Instructional Design references and the needs of the company, and closely follows the theories of Gagne and Briggs. The IDM includes 14 stages, labeled below as A through N, and is divided into three different levels of operation, the system, course, and lesson levels. The breakdown of the levels is:

- System Level
  - A. Needs, Goals, and Priority Analysis
  - B. Resource Analysis
  - C. Individualized Delivery System
- Course Level
  - D. Module Scope, Objectives, and Sequence
  - E. Target Objectives Definition and Analysis
- Lesson Level
  - F. Performance Objectives Definition
  - G. Lesson Module Preparation
  - H. Materials and Media Selection
  - I. Student Performance Assessment
- System Level
  - J. Instructor Preparation
  - K. Formative Evaluation
  - L. Field Testing and Revision
  - M. Summative Evaluation
  - N. Installation and Diffusion

Appendix A contains a flowchart which graphically illustrates the recommended IDM process and shows the

interaction and review process within the IDM levels. The systems level allows a long-range curriculum and/or course module(s) to be developed by emphasizing the present needs of the company's employees and providing a means of course improvement for the future. This will insure that the needs of the future will be met at the lowest cost.

The following explains each step of the Instructional Design Model:

A. NEEDS, GOALS, AND PRIORITIES ANALYSIS

The primary need for computer training arises because the company expects to purchase about 200 new PC's per year for the next several years. The majority of the PC's will be placed on the desks of office workers, managers, and executives who have limited, or no, computer knowledge. A structured training program will provide an effective solution to the company's problem.

The goal of the training program is to increase employee productivity through the use of individualized instruction. The basic measurement of increased productivity is defined as one or more of the following:

- Reducing the time an employee spends doing a required task.
- Simplifying an administrative process through automation, thereby requiring a lower level employee to perform the task.
- Using the computer to obtain more accurate information, thus allowing management to make better business decisions.

The priorities of the program require an in-depth job

performance analysis. The analysis should focus on the current employee performance and the employee performance required to indicate a significant increase in skills and productivity. Based on this analysis, terminal performance objectives should be established. The curriculum and each course module should address the specific terminal performance objectives. They should also provide a building block for future advanced study. Hence, these educational needs must be identified and analyzed. If designing and implementing a program to meet those educational needs will provide a significant financial return to the company for the cost extended, then the validation exists for proceeding with the development of the training program.

B. RESOURCE ANALYSIS

Choosing an effective instructor is an important but often forgotten element in the course development stage. Usually an employee is chosen who is knowledgeable in the subject matter but has no special training as an educator or even the will-to-educate. These instructors often erroneously define their responsibility to the subject matter they teach rather than to the student who is learning. Consequently, much of the material they present to students is pre-designed systematic presentations which the student is merely required to comprehend, rather than presentations which are tailored to meet the needs of individual backgrounds and learning styles.

On the other hand, a professional educator does not

have the knowledge of the environment that the students work in and consequently is unable to choose adequate material that should be presented for later application in the work area.

The ideal candidate for an instructor is a person within the company who has had training as an educator. If this is not possible, the next best candidate is a knowledgeable person who has the desire and motivation to teach. The alternative is an educator from outside the company who is knowledgeable in the subject.

C. INDIVIDUALIZED DELIVERY SYSTEM DESIGN

The course goals should be specifically designed to meet the performance goals established during the needs analysis. The learning should be built on the employees' prior knowledge and experiences, and the course goals should build upon each other to demonstrate progress in learning. This concept is re-inforced in several research studies which show that students learn better when using prior knowledge as the base to advanced learning. Abbott, Black, and Smith (1985) report that

> "prior knowledge plays an important part in facilitating the understanding processes of a reader. People read much faster and understand better than would be possible if each unit of information were processed in isolation without referring to prior knowledge to help decide what connection the item has with the rest of the passage."

Lorch and Lorch (1985) found that providing students with advance information about the subject led to good recall

relative to when no advance information was given. According to Ausubel (1968), when new areas are related to relevant, established concepts in the student's previously acquired knowledge, more new material is acquired more easily and retained better. The student would continue to learn the subject matter in the work environment well after the training session as a result of the skills and objectives learned and discovered.

Students will enter the course with varied educational backgrounds and experience, so, with the exception of an introductory course, it is best to develop a "subject specific" training module in which the students adapt the instruction to themselves. Students should be allowed to structure the material to their own learning style to individualize their learning and discover the subject material at their own pace. This will allow the instructor to be less concerned about the delivery method and improve student learning.

D. MODULE SCOPE, OBJECTIVES, AND SEQUENCE

Typically the training modules should be a minimum of one-half day long and should not exceed two days. To enable complete coverage of a specific subject area, several course modules should be structured in a planned sequence.

This stage involves explicitly stating the scope, the prerequisites, and the objectives of the course module. The module structure can be given absolute clarity when human performances are described. Gagne and Briggs (1974) pointed

out, "the question to answer is ...not 'What will students be studying?' but rather, 'What will students be doing after they have learned?'"

After determining the course module scope, course modules objectives should be listed. Often it is difficult to decide whether all of the objectives should be specified or only some of them. This arises because often there are two different kinds of objectives: target objectives, which are acquired at the end of the module, and enabling objectives, which must be acquired either prior to or during the module study because they are prerequisites to the former. Because the modules will be short in duration, normally only the target objectives should be listed. They should be grouped to form a gross structure of the module and in the order they will be learned.

E. TARGET OBJECTIVES DEFINITION AND ANALYSIS

The target objectives should be broken down into three basic categories and analyzed. These categories are:

- Target objectives or the outcome of the learning.
- Conditions under which the learning will take place.
- A learning task analysis to reveal enabling objectives.

Categorizing target objectives helps the module designer detect if any intended purpose of the module is being overlooked and permits uncovering enabling objectives, which in turn may become the focal point for designing a

prerequisite module.

The significance of enabling objectives should not be ignored, as shown by the following example. It is supposed that there was a request by a department manager to teach his employees to manage data better than the current hand processing method. After reviewing the job needs, it was determined that some of the data was better managed using DBase III, and other data by Lotus 123. As a result, an introductory course module(s) was planned with a target objective of teaching the employees the software application package (DBase or Lotus). If the module scope did not include some theory behind the software application, an important enabling objective is being overlooked, the rationale being that without first teaching the employees about some of the basic theory of computer data bases, the employee would only develop data bases that would emulate their present pencil-and-paper procedure. Users of Lotus 123, not having been exposed to the principles and power of electronic spreadsheets, would simply be using the computer as powerful calculators and/or word processors. In both cases, the employees may never learn to use the full power of the application software, thereby limiting their productivity potential.

F. PERFORMANCE OBJECTIVES DEFINITION

Defining performance objectives reduces ambiguity to a low level and fills two basic needs in the IDM: the need for communication of the purposes of the instruction, and

the need for evaluation of the instruction. "Precisely defined objectives provide a common technical basis for meeting both of these needs" (Gagne and Briggs, 1979). Stated differently, objective definitions insure that what is evaluated, and what is communicated as an intended learning outcome, have a common meaning.

To overcome the ambiguity in objective statements, it has been recommended that the following components be included: the action, object of the action, the situation faced by the student doing the action, the tools or other constraints the student is faced with to carry out the action, and the capability to be learned by doing the action (Mager,1975; Popham and Baker, 1970; Gagne and Briggs, 1979). The following example demonstrates the use of these components.

Given a blank diskette,	(Situation)
the student is able to construct	(Learned Capability)
a TREE directory structure with three sub-directory levels	(Object)
using	(Action)
an IBM PC without the aid of text books or notes. The student's software package will be located at the second sub-directory level and the application files will be at the third sub-directory level.	(Tools/Constraints)

In summary, the identification and definition of performance objectives are important steps in the design of instruction. The objectives serve as guidelines for developing the instruction as well as designing measurements

of student performance to determine whether the course objectives have been reached. Additional information on preparing objectives can be found in the book by R. F. Mager, Preparing Objectives for Instruction, Second Ed. Belmont, Ca., Fearon, 1975.

G. LESSON MODULE PREPARATION

The lesson modules should be prepared to assist the students to attain each performance objective. Each module should address the following elements:

- Stated module objectives with a rationale statement that explains why the objective is important.
- Activities to be performed by the instructor and the student during the course.
- Materials, media, and references needed by the instructor and the student.
- A self-check test that the student is expected to take at the end of the course.
- Any special instructions for presentation of the completed work.

Appendix B includes a sample lesson plan for a pilot course entitled "Instruction to the IBM Disk Operating System" that illustrates the above elements.

H. MATERIALS AND MEDIA SELECTION

The entire course should be prepared using selected, high quality media existing at the company. Transparencies are recommended to facilitate class participation, and a 35mm slide projector should only be used during a lecture session when student participation or feedback is not required.

Transparencies should be prepared using acetate sheets on a color plotter, with the content facilitated by using ChartMaster, SignMaster, or Lotus FreeLance software. The 35mm slides should be multi-colored and prepared by the Communication Arts department. Student responses elicited through the pilot training seminars should form the basis for developing or changing the material.

I. STUDENT PERFORMANCE ASSESSMENT

Students enter the class because either they have interest in the subject and want to improve their skills, or their department manager suggested that they take the class for job development. In both job-related instances, the entering student is generally motivated to learn.

After instruction it is necessary to assess whether knowledge was learned and whether it has improved student performance. The assessment should be made through comparison of a pre-test on course prerequisites and a post-test on acquired knowledge. The post-test may be a written exam, oral report, or an evaluation of work diskettes.

The course module target objectives should be considered as being met if 80% of the students receive 90%+ on the post-test and complete the remaining classwork satisfactorily.

J. INSTRUCTOR PREPARATION

The instructor may not have experience as an educator or be comfortable with using the individualized approach as

discussed in ANALYSIS OF RESOURSES, but it is important that the instructor be counseled in all the concepts and techniques contained in the course material. Major emphasis should be placed on the educational concept that prior knowledge plays an important role in facilitating the learning process. The effectiveness of any course depends greatly on the enthusiasm of the instructor; therefore every effort should be made to elicit the instructor's cooperation and support when using the individualized teaching approach.

K. FORMATIVE EVALUATION

The course content should be evaluated by an outside observer and a small pilot group representing a cross-section of the PC user community in the company. The evaluations and the recommendations of the pilot group and the observer should be incorporated into the course. Appendices C, D and E contain recommended checklists that should be used to collect meaningful evidence regarding the course's effectiveness from the viewpoints of the instructor, observer, and students, respectively.

L. FIELD TESTING, REVISION

After incorporating the revisions from the pilot groups into the final course material, the course module can be used for the remaining employees in the company. The instructors should keep extensive notes and address any recurring problems so that perceived solutions can be used in the next session.

M. SUMMATIVE EVALUATION

The academic performance of the students should be monitored the first year, with the goal that 80 percent of the students must score 90 percent or above on the written quiz. Changes in the course lectures should be made, if necessary, to improve the scores. If students consistently attain these scores, either the course content should be increased or the course time decreased, until the mean student scores fall within the required range.

One year after offering the course, a questionnaire should be sent to all students asking them to quantify productivity gains they feel were realized as a direct result of the course. The instruction should be considered successful if 80 percent or more of the course content is maintained, the above academic conditions are met, and a minimum of 20 percent DCF-ROI is realized after including all the course costs and wages paid while the student was in class.

N. INSTALLATION AND DIFFUSION

The findings of the evaluation study should be summarized and submitted to the Director of Business Systems. Once the goals and objectives of the course module are achieved, the entire program including concepts and materials should be made available to the training and education departments of all the company's sister divisions, worldwide. worldwide.

Finally, it is recommended that the summative

evaluation of successful course modules should be presented at a Training and Education conference to share with others the training techniques and methodologies that significantly increased employee productivity.

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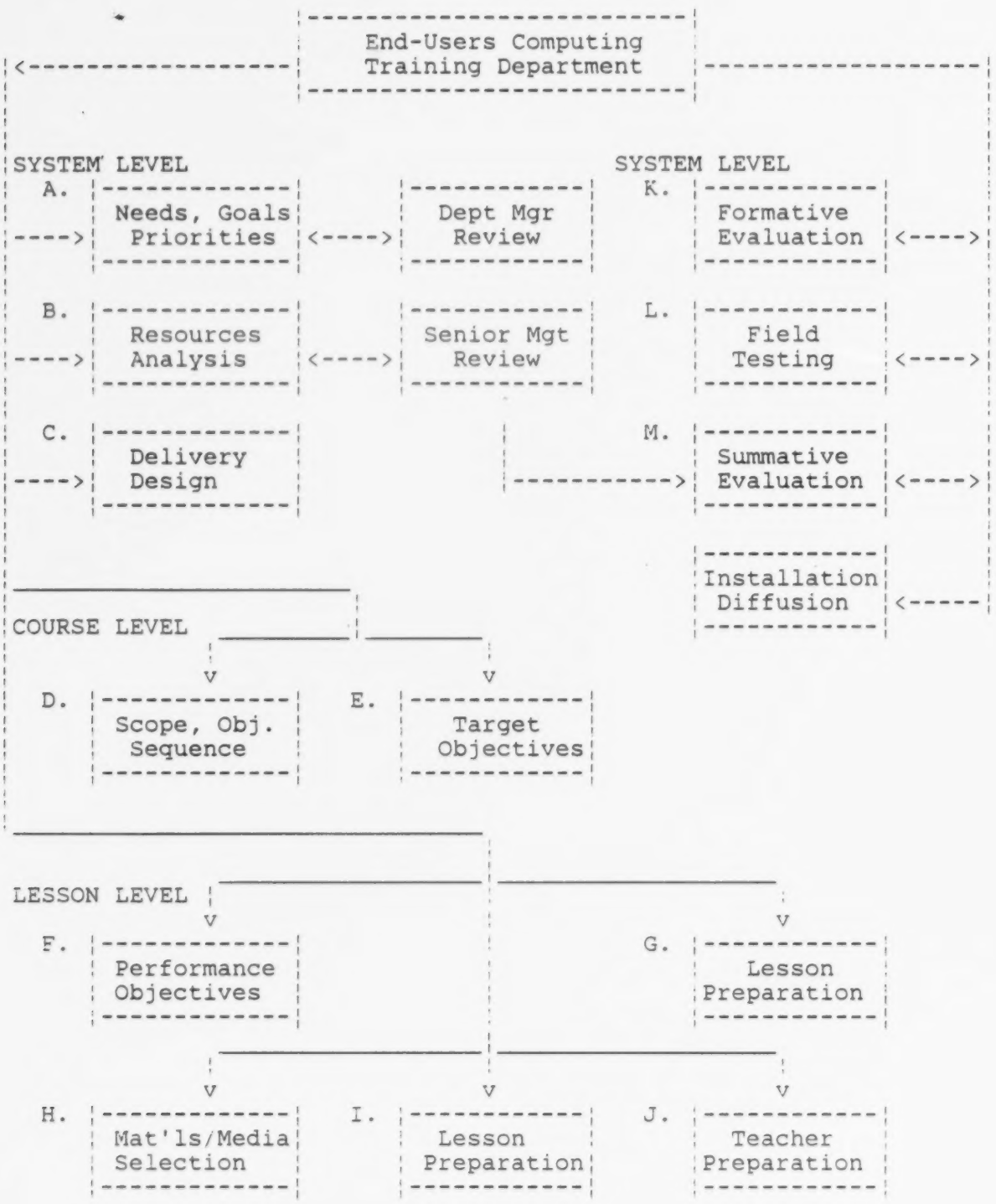
APPENDIX A

INSTRUCTIONAL DESIGN MODEL CHART

INSTRUCTION DESIGN MODEL CHART



APPENDIX B

SAMPLE LESSON MODULES

INTRODUCTION TO THE IBM-PC DISK OPERATING SYSTEM

Lesson Plan for Module 1

Objectives

1) To describe a disk operating system and reference at least five commonly used DOS commands.

Rationale: The student receives the background necessary for understanding the software that gives life and personality to the computer.

2) To give examples of how three DOS commands are used with specific examples relating directly to the student's work environment.

Rationale: Information learned should be applied to the work environment with the aim of increasing productivity.

Activities

Instructor gives a structured lecture presenting the PC disk operating system and gives an overview of the DOS commands. He will be available to answer specific questions during the workshop.

Student works on the computer to gain experience in executing DOS commands for his application software. At the conclusion of the lecture session, the student completes a quiz on the course material.

Materials

An overhead projector for transparencies for instructor use. Pencil and paper are the responsibility of the student. The IBM reference book Disk Operating Systems-Version 3.0 also should be brought to the session or it can be purchased at the session and charged directly to your department. Each student will have access to an IBM-XT/AT. Copies of the transparencies will be given to each student.

Self-Test

The student should be able to answer the following questions at the conclusion of Module One.

1. Which of the following statements are true about DOS:
   a) Gives the computer a personality.
   b) Manages the resources of the system.
   c) Has 10 user commands.
   d) Runs programs.
   e) Cannot be customized to suit user needs.
   f) Handles user interaction.
   g) Has a built-in text editor.

2) What are three reasons why directories should be used on a fixed disk?

3) How are directories organized? Draw a simple TREE directory hierarchy showing three levels.

4) What are the commands to make and remove a sub-directory?

5) Why can't data files be located even when they are located in the correct PATH?

6) What is a BATCH file? What extension, ie., "batchfilename.???", does a BATCH file have?

7) What are five commonly used DOS commands?

8) What are three examples of how DOS commands could improve your productivity in your work environment?

Special Instructions

Before leaving class, each student will receive his corrected quiz. He may keep the work diskette but must bring it with him to the next class session.

Before the next class session, the student must read selected sections of the DOS manual and be prepared to give a five-minute oral report on DOS filters, pipes, or redirectives stating how the DOS commands could improve his productivity. He must prepare a one-page maximum abstract or outline on the report to share with others.

Lesson Plan for Module 2

Objectives

1) To construct a TREE directory structure with three sub-directory levels without the aid of text books or notes when given a blank diskette. To place the application software package in the second sub-directory level and the data files in the third sub-directory level.

Rationale: This operation demonstrates comprehension of the concepts of the TREE directory and the ability to install existing and new software application programs on a hard disk.

2) To write a BATCH file to set the proper path to: execute the application file, run DOS commands from the sub-directory, and return to the root directory on completion of the program. The student is given a DOS manual and a diskette with an application file in the second sub-directory level from the root directory and a data file in the third sub-directory.

Rationale: Proper hard disk maintenance requires separation of data files from the application files. This technique also allows various users of the same PC to keep their files in separate directories.

3) Through an external reading program, to give a five-minute oral report on DOS filters, pipes, or redirectives stating how the DOS commands improve personal productivity and to prepare a one-page maximum abstract or outline on the report to share with others.

Rationale: Sharing newly learned expertise orally with co-workers indicates that the student is becoming an expert on a particular DOS command. Sharing expertise with co-workers increases their productivity as well.

Activities

Instructor gives a review lecture and answers any questions the students may have. He will then conduct the oral discussions on the DOS commands.

	Students present their five-minute oral reports on DOS filters, pipes, or redirectives. With the remaining time, they will work on performance objectives one and two.
Materials	An overhead projector will be available for instructor or student use. Students are required to bring a copy of their oral report abstract for everyone in the class. The IBM DOS manual version 3.0 is required to complete the lessons.
Self-Test	No testing will be done in this module.
Special	Each student must fill out the Seminar Instructions Training Questionnaire before leaving the classroom.

APPENDIX C

INSTRUCTOR EVALUATION -- FORMATIVE

INSTRUCTOR EVALUATION -- FORMATIVE

Course Name: _____ Date:_____

Instructor: _____

This is a pilot course module you just presented. Please complete the following questionnaire to assist in improving the course.

---

1. Assess the overall quality of the course module.

___ Excellent
___ Good
___ Fair
___ Poor
___ Very Poor

2. How effective is the course in terms of student learning?

___ Very Effective
___ Effective
___ Somewhat Effective
___ Barely Effective
___ Not Effective

3. Estimate the degree of interest or absorption of the employees in the lessons.

___ Enthusiastic Interest
___ High Interest
___ Medium Interest
___ Low Interest
___ No Interest

4. What practical difficulties were encountered in conducting the lesson, for example, running overtime, equipment availability, etc.?

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

5. What difficulties were encountered in carrying out the intended instructor procedures?

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

6. List the parts of the course you felt were effective.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

7. List the parts of the course you felt were ineffective.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

8. List suggestions to improve the course.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

APPENDIX D

OBSERVER EVALUATION -- FORMATIVE

OBSERVER EVALUATION -- FORMATIVE

Course Name: _____ Date: _____

Instructor: _____

Observer: _____

This is a pilot course module you just observed. Please complete the following questionnaire to assist in improving the course.

---

1. Assess the overall quality of the course module.

___ Excellent
___ Good
___ Fair
___ Poor
___ Very Poor

2. Estimate the degree of interest or absorption of the employees in the lessons.

___ Enthusiastic Interest
___ High Interest
___ Medium Interest
___ Low Interest
___ No Interest

3. What practical difficulties were encountered in conducting the lesson, for example, running overtime, equipment availability, etc.?

a. _____
b. _____
c. _____
d. _____
e. _____

4. What difficulties were encountered by the instructor in carrying out the intended procedures?

a. _____
b. _____
c. _____
d. _____
e. _____

5. In what respects are (are not) the materials and media employed in the way intended by the course designer?

a. _____
b. _____
c. _____
d. _____
e. _____

6. In what respects does (does not) the instructor carry out the procedures and make the decisions?

a. _____
b. _____
c. _____
d. _____
e. _____

7. In what respects do (do not) the students follow the general procedures specified?

a. _____
b. _____
c. _____
d. _____
e. _____

8. List the parts of the course you felt were effective.

a. _____
b. _____
c. _____
d. _____
e. _____

9. List the parts of the course you felt were ineffective.

a. _____
b. _____
c. _____
d. _____
e. _____

10. List suggestions to improve the course.

a. _____
b. _____
c. _____
d. _____
e. _____

APPENDIX E

STUDENT EVALUATION -- FORMATIVE

STUDENT EVALUATION -- FORMATIVE

Course Name: _____ Date:_____

Instructor: _____

This is a pilot course module you just completed. Please complete the following questionnaire to assist in improving the course.

---

1. Assess the overall quality of the course module.

___ Excellent
___ Good
___ Fair
___ Poor
___ Very Poor

2. Estimate the degree of interest the group, as a whole, showed in the course module.

___ Enthusiastic Interest
___ High Interest
___ Medium Interest
___ Low Interest
___ No Interest

3. How likely are you to use the information you learned in the course in your work environment?

___ Very Likely
___ Likely
___ Not Likely, explain why.

_____
_____
_____

4. How likely are you to recommend this course to your co-workers?

___ Very Likely
___ Likely
___ Not Likely, explain why.

_____
_____
_____

Jila

5. Were you able to achieve the stated performance objectives of the course in the time allotted.

___ All of the Objectives
___ Most Objectives
___ Some Objectives
___ Few Objectives
___ None

6. What practical difficulties did you encounter in taking the lesson, for example, equipment availability, completing the assigned tasks, etc.?

a. _____
b. _____
c. _____
d. _____
e. _____

7. List the parts of the course that you think were excellent and/or should be continued.

a. _____
b. _____
c. _____
d. _____
e. _____

8. List the parts of the course that you think were poor or in need of improvement.

a. _____
b. _____
c. _____
d. _____
e. _____

9. List suggestions to improve the course.

a. _____
b. _____
c. _____
d. _____
e. _____

APPENDIX F

COURSE MODULE DESIGN CHECKLIST

COURSE MODULE DESIGN CHECKLIST

A. Needs, Goals, and Priorities Analysis

- o Job need analysis was performed. Y N Unclear
- o Job performance requires improvement. Y N Unclear
- o Goals are expressed in productivity performance terms. Y N Unclear
- o Payback to the company is high. Y N Unclear

B. Resources Analysis

- o A qualified instructor with teaching experience is available within company. Y N Unclear
- o Instructor has motivation to teach and is familiar with subject matter. Y N Unclear
- o An outside teaching consultant/trainer is available at a reasonable cost. Y N Unclear

C. Individualized Delivery System Design

- o Course design includes original needs analysis and goals. Y N Unclear
- o Goals are specific. Y N Unclear
- o Course shows progress in learning. Y N Unclear
- o Delivery system employs individualized learning. Y N Unclear

D. Module Scope, Objectives and Sequence

- o Major course objectives are defined into modules. Y N Unclear
- o Modules are less than two days long. Y N Unclear
- o Modules represent a single skill area with well defined target objectives. Y N Unclear
- o Significant enabling objectives are not required to meet the target objectives. Y N Unclear
- o Each module is required to attain the goals. Y N Unclear

E. Module Target Objectives Analysis

- o Planned target objectives are adequately described in precise definition terms. Y N Unclear
- o Learning conditions are included. Y N Unclear
- o Enabling objectives are included in the scope. Y N Unclear

F. Performance Objectives Definition

- o Final performance objectives are described. Y N Unclear
- o Course objectives include the following:
  - Action required to achieve the goal. Y N Unclear
  - Object outcome of the goal. Y N Unclear
  - Situation student is dependent upon. Y N Unclear
  - Tools and constraints are identified. Y N Unclear
  - Capability or kind of performance expected. Y N Unclear
- o Relationship exists between:
  - Course goals and the instruction. Y N Unclear
  - Instruction delivery and student evaluation. Y N Unclear
  - Student evaluation and course goals. Y N Unclear

G. Lesson Plans Module Preparation

- o Designed to gain attention. Y N Unclear
- o Informs learner of lesson objectives. Y N Unclear
- o Objectives include rationale stating "why." Y N Unclear
- o Includes instructor/student activities. Y N Unclear
- o Describes needed materials, media, and references needed by instructor and student. Y N Unclear
- o Includes a pre-test. Y N Unclear
- o States special instructions. Y N Unclear
- o Builds on previous lessons. Y N Unclear
- o Presents stimulus materials. Y N Unclear
- o Employs learning guidance techniques. Y N Unclear
- o Elicits students active involvement. Y N Unclear
- o Provides feedback on performance. Y N Unclear
- o Assesses performance of the new skill Y N Unclear
- o Enhances earlier lessons and concepts. Y N Unclear

H. Materials and Media Selection

- o Selection provides best method of meeting the course objectives. Y N Unclear
- o Is adaptive to different skill levels. Y N Unclear
- o Necessary hardware/software is obtainable. Y N Unclear
- o Alternative media selections compared. Y N Unclear
- o Costs are reasonable and budget is available. Y N Unclear

I. Student Performance Assessment

- o A pre-test of entering capabilities is given. Y N Unclear
- o A post-test measures acquired target knowledge. Y N Unclear
- o Assessment test measures performance of:
  - Each student. Y N Unclear
  - The entire group of students. Y N Unclear
- o Post-test measures only course objectives. Y N Unclear
- o Post-Test is neither easy or difficult. Y N Unclear

J. Instructor Preparation Plan is Included Y N Unclear

K. Formative Evaluation

Includes a questionnaire seeking the following kind of information:

- o From an Observer
  - Use of media. Y N Unclear
  - Carrying out of procedures by teacher. Y N Unclear
  - Following of procedures by students. Y N Unclear
- o From the Teacher
  - Difficulties encountered. Y N Unclear
  - Students interest. Y N Unclear
- o From the Students
  - Application to job. Y N Unclear
  - Student attitude about course. Y N Unclear
  - Met course objectives. Y N Unclear
  - Student test results. Y N Unclear

L. Field Testing and Revision

- o Presents a pilot test program. Y N Unclear
- o Includes all course costs. Y N Unclear

M. Summative Evaluation

- o Includes evaluation of the existing course. Y N Unclear
- o Quantifies aptitude variables. Y N Unclear
- o Identifies final evaluation goal to be attained. Y N Unclear
- o Includes a summative evaluation questionnaire. Y N Unclear

N. Installation and Diffusion

- o Includes plan to make the new course available to other divisions within the company. Y N Unclear